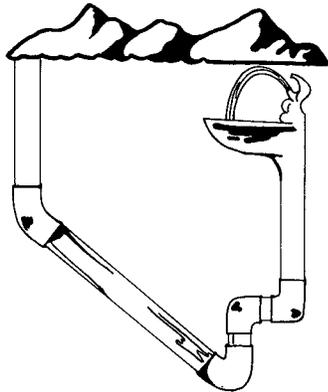


Water Lines



Water Lines is the resource newsletter and calendar of the Nevada Drinking Water and Wastewater Training Coalition.

Volume 29 Summer 2008 Issue

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In this Issue: Focus on Water Treatment

Water Lines is funded by
the Nevada Division of
Environmental Protection

Editor, Brent Farr, P.E.

Editor, and Production, Joe Beard Jr.

Featured Operator: Scott Fleckenstein

By Joe Beard Jr., Farr West Engineering

Scott Fleckenstein was born and raised in Dayton, Nevada. He graduated from Dayton High School, and attended Western Nevada Community College.

Scott got his introduction to the water industry at Dayton Valley Country Club. He worked there while he was still in high school. He worked for the country club for over ten years, learning about irrigation and pressurized flow fundamentals.



Scott Fleckenstein of LCU

In 2001, Scott heard about an opening at Lyon County Utilities (LCU). After passing an examination, he was hired as an Operator in Training (OIT). He quickly qualified for his Grade 1 Distribution Certification.

Through in-house training



provided by LCU, and periodic training from the Nevada Rural Water Association (NvRWA), Scott has been able to increase his level of expertise. Scott currently holds Grade 3 Distribution and Grade 3 Treatment Certifications, as well as a Backflow Testing Certification from AWWA.

Scott is proud of the many projects he has participated in during his work at LCU. Some of these projects include the rehabilitation of water systems in Willow Creek and Mound House, a meter replacement project, and work on the Vidler Line Tie-In. This last project aims to connect a 3 MG tank in Carson City with the distribution system in Dayton.

He has also worked to update and improve Emergency Response Plans (ERPs) for Crystal Clear Water Company and the Dressler Park Water System. Scott tries to take a proactive approach to plan review and revision.

Scott is looking forward to some exciting projects in the future, as well. He will assist LCU in making improvements to the water distribution system, such as eliminating dead-ends through looping. These improvements will also include redundant tie-ins to existing water storage tanks, and improve system flexibility.

Increased redundancy and flexibility will enable

(Continued on page 7)

Regulatory Feature: New Lead and Copper Rule Changes

By Ross Cooper, NDEP

The new revisions to the Lead and Copper Rule became effective December 10, 2007, with the goal of further reducing exposure to Lead in our Drinking Water, and informing consumers of any problems more quickly and thoroughly.

Provisions related to copper will be addressed in future revisions to the rule. But all Public Water Systems, regardless of size, will be impacted to some degree.

The areas of focus include:

1. Advanced notification to State and approval of change is required prior to implementation. Addition of new sources would include:

- Based on impact, the State may require a return to Standard Monitoring (annual samples plus a temporary increase in the number collected).
- State has the option of developing a custom monitoring program.
- EPA is to provide guidance on evaluating optimal corrosion control based on source water changes, such as changing the mixture.

2. Any long-term changes to water quality might result in an increase in the frequency of sampling.

3. Reduced Monitoring Criteria

- Lead Action Level (AL) Exceedance: PWS cannot remain on reduced monitoring based only on water quality parameters; (does not apply to Copper AL Exceedance).

4. Definitions for compliance & monitoring periods

- Monitoring Period: A PWS is required to sample during the summer months from June through September.

- Compliance Period: 3-year calendar year period within a 9-year compliance cycle.

- Six months for small/medium systems to collect water quality parameters if a System has exceeded the action limit for Lead.

5. A new requirement to provide each customer at a monitoring location with the analytical results of their sampling.

- Customer Report: All customers who are in the Lead/Copper monitoring program must be provided analytical results for each monitoring time period.

- EPA has provided guidelines for the content of the report that is delivered to the customer.

6. Public education information

- Public Education Requirements: All PWSs will include an educational statement about lead in their Consumer Confidence Reports.

- Rule Revision: Systems must provide notification of lead in drinking water results in 30 days of receipt of results to occupants at sites that are tested in the LCR tap monitoring program.

- In the event of an exceedance, the System has 60 days to complete public education.

- Delivery requirements to reach both bill paying and non-bill paying customers: In the event of an exceedance, organizations that must be contacted by PWS also will include licensed childcare facilities, obstetricians-gynecologists and midwives, and schools.

7. Notice of Lead Monitoring results to occupants

• Delivery Mechanisms

- Mail or another method approved by the State.

- Must provide notice even if occupants do not receive water bills.

• Example for NTNCWS in rule

- Upon approval from the State, System could post results on a bulletin board at the facility.

• Reporting requirements

- 3 months from end of monitoring period.

- System must submit sample copy of notification.

- System must certify that notification requirements have been met.

The Spigot

Q & A:

Focus on Fundamentals



Q 1. To determine pressure when given feet of head, multiply by _____ psi per foot of head.

Q 2. Chlorine demand can be determined by subtracting the _____ chlorine from the chlorine dose.

Q 3. To determine Flow (ft³/sec) in a pipe, multiply the Area of the circle in square feet, times the _____ in feet per second.

Q 4. There are _____ feet in one U.S. Mile.

Q 5. The area of a circle can be found by multiplying _____ by D² (the diameter squared).

Answers to Spigot

5. 0.785

4. 5,280

3. Velocity

2. Residual

1. 0.433

Crystal Montecinos, Consultant, Tigren Inc., prepares The Spigot.

Safety Zone: Lock Out / Tag Out

By Stevan Palmer, RCAC

As a utility operator, you will probably be called upon to fix or maintain electrical or mechanical equipment. The OSHA standard for The Control of Hazardous Energy (lockout/tagout), Title 29, CFR Part 1910.147, addresses the practices and procedures required to disable machinery or equipment and prevent unintended releases of hazardous energy. When performing lockout/tagout procedures, there are several types of energy to be considered, including Electrical, Mechanical, Chemical, Thermal, Hydraulic and Pneumatic energy.

As little as 30 volts of electricity can carry enough current to kill. Mechanical energy may be kinetic energy, as from parts in motion, or potential energy, as in a spring under load, or an elevated part. Chemicals may have energy that can start a fire or burn the skin. Thermal energy can cause burns, and very cold temperatures, as when compressed gasses are released, can freeze the skin. Hydraulic energy may cause equipment to move, or parts to be ejected, because of pressurized liquids. Pneumatic energy may also cause injuries if there is an uncontrolled release of air or gasses under pressure.

Any given piece of equipment may contain one or several types of hazardous energy that must be isolated. Only a person who has been trained and authorized by management may lock out a piece of machinery.

The six steps for a lockout procedure are as follows. First,

prepare for shutdown. Understand the particular hazards of the equipment to be worked on. Notify others working in the area of the shutdown. Second, shut down the equipment using normal procedures. Turn off all switches, close all control valves, and disable all sources of energy.

Third, isolate all energy sources. This may include opening electrical breakers or disconnects, blocking parts against movement, turning off air compressors, etc. Fourth, place locks and tags. Lock out valves and electrical breakers, block or disconnect all lines, place "plug buckets" over electrical plugs, and lock and tag blank flanges.

Fifth, release or block all stored energy. Stop rotating flywheels, block or release springs, relieve system pressures, drain fluids or chemicals, vent gasses, block elevated parts, and discharge capacitors. Sixth, verify that the equipment is isolated. Make sure all workers are clear of the area, double check all the locking devices, and attempt to start the device. Once isolation is verified, return all controls to off.

When all repairs are complete, inspect the area and equipment. Make sure any machine guards are back in place, remove tools from the equipment, and notify others in the area that the equipment will be restarted. Restore all system connections, ensure that every person who worked on the equipment has removed their locks and tags, and finally return the equipment to normal operation.

Featured System: Churchill County's Sand Creek Plant

By John Allred, NvRWA

In 2006, Churchill County became responsible for the operation, maintenance, and administration of the Pine Grove Water System. This is the first Phase of a County-owned and operated municipal system. The new system will consolidate several small systems, many of which need arsenic treatment. The Sand Creek project included water treatment for arsenic and manganese and adequate infrastructure replacement for the prior Pine Grove and Country Club Estates water systems. Construction of the new water plant at Sand Creek was completed in September of 2007.

Phase 1 of County operations provides water for more than 250 accounts including Country Club Estates, the Pine Grove Subdivision, the Sand Creek Development, two mobile home parks and several commercial accounts in the vicinity along Highway 50. The water plant at Sand Creek is capable of delivering water for fire suppression at any time to the service area. This plant was designed and constructed to satisfy all Nevada State, AWWA and EPA standards. Total treatment facility cost, not including distribution improvements came to \$5.3M. Funding was obtained from USDA Rural Development (low-interest loan, 46%) and a State of Nevada AB198 grant (54%); Churchill County and Developers contributed \$0.75 million.

EPA has identified best available technologies (BATs) and small system compliance technologies (SSCTs) for removing arsenic from drinking water (40 CFR 141.62(c)&(d)). In the Arsenic Rule, oxidation/filtration (including greensand filtration) is listed as both a BAT and SSCT. EPA listed oxidation/filtration as a BAT with a footnote stating that to obtain high arsenic removals, the iron-to-arsenic ratio must be at least 20:1.



Pressure Filters

There were a multitude of problems at plant start up, but with the assistance of the new Churchill County Capital Projects and Engineering Manager, Misha Stojicevic, these problems have been resolved and the plant is up and running. One of the problems was that the ferric chloride being added to the water to remove arsenic was passing right through the filters. This was solved by the addition of a polymer and an in-line static water mixer. Using a HACH DR 2800 Spectrophotometer to perform colorimetric iron analysis, the

Churchill County Staff was able to find the optimum dosage of 3.7 ppm of ferric chloride, 2.6 ppm of sodium hypochlorite and 0.2 ppm polymer. The result is that the water produced at the Sand Creek water plant is non-detect for arsenic. A free available chlorine residual is detectable at the downstream end of the filtration process as per SDWA and EPA requirements.

The site for this plant was chosen due to the water quality of the well. The arsenic concentration in the well water at Sand Creek is much lower than in surrounding wells. The arsenic level in the water from the Sand Creek well is only 16 ppb (parts per billion) vs. as high as over 100 ppb in surrounding area wells. Initial lab results for the new well showed a manganese concentration of 0.13 mg/L, which was a decision making factor for using greensand media. However the manganese level has dropped since the well was put into use. Except for the arsenic, the raw water quality of this well is excellent.

The on-site supply well pumps water through the water treatment plant and into a storage tank which is also at the plant site. Based on a pumping test, the three-hundred foot deep well can produce just over 1,400 gallons per minute. However, a pumping rate of 750 gpm is sufficient at this time. Following treatment, water is re-pumped into the distribution system using one small (300 gpm), and three

Featured System: Churchill County's Sand Creek (Continued from page 4)

large (1000 gpm) VFD controlled pumps to provide a constant pressure at the most economical value. These four VFD controlled pumps respond to flow demands, maintain system pressures and save energy. There is also one, 4000 gpm diesel powered emergency fire suppression pump available.

The treatment or filtration process at this facility is based on using greensand and anthracite to remove arsenic from the water. Chlorine is added as an oxidant to change As^{+3} to As^{+5} . Addition of ferric chloride to adsorb the As^{+5} is necessary because water from the well has an insignificant iron level. The adsorbed arsenic is then removed along with the iron in the anthracite-greensand filters. There are three large pressurized filter vessels in series. All three are on line except during a thirty minute backwash cycle. While any one filter is backwashed, the other two filters handle the total flow. Each of the filters is backwashed within the thirty minute sequence.

Backwash is initiated after a filter run time of 18 hrs, or when the differential pressure across the filter goes over 10 psi. The backwash procedure is controlled by computer and is self operational. The filter backwash water goes to a backwash water waste tank where it settles for two hours. Then all but the bottom two feet of the tank (about 85% of the backwash water) is pumped at a low flow back into

the front of the water treatment process. The remaining two feet of the tank (15%) is drained off slowly into the sewer system, finally reaching the waste water treatment plant. Like the City of Fallon and Fallon Paiute-Shoshone facilities, this water plant uses iron adsorption with coagulation and filtration. It is quite different from the other two arsenic treatment plants in the Fallon area, as there is no pH adjustment and no sludge dewatering needing solid waste removal.

The Churchill County Waste Water Treatment Facility is located on the golf course west of the City of Fallon. There is a second County wastewater treatment facility that is going in on Moody Lane. This facility is being built to serve those customers on the north side of Highway 50 across from the Pine Grove and Sand Creek areas, including growth around the Moody Lane area.

This is a very unique wastewater facility which will use membrane technology capable of producing an effluent comparable to drinking water quality. The membrane system at this plant was designed and produced by Zenon (part of the General Electric Corporation). This plant will be odor-free and fully computerized. As with the Sand Creek Water Treatment Facility, SCADA (Supervisory Control and Data Acquisition) capabilities will include remote monitoring and control by

computers or cell phones. Another unique feature of this collection and treatment facility is the odor control aspect, as ozone will be used instead of the more conventional chemical or air filtering processes. Misha Stojicevic demonstrated the efficiency of the onsite ozone generators, which are currently in place at lift stations and at the Pine Grove subdivision.

Responsibility for all utilities including the Sand Creek and Moody Lane facilities falls under the Churchill County Capital Projects and Engineering Manager, Misha Stojicevic. Churchill County has contracted with SPB Utilities to manage billing and to operate the water and sewer systems. During normal business hours you can contact them at 1-800-706-6531. Bill Pace is the on-site operator.

A new water rate schedule went into effect with this new arsenic removal plant, which is quite extensive in its coverage including water use type, meter size and quantity of water used. Customers of this system are charged a fully metered rate with a base charge. For a residential customer with a $\frac{3}{4}$ or 1 inch meter the monthly base charge is \$39.00. Additional charges are currently \$2.00 per 1,000 gallons for the first 0-6000 gallons, \$2.50 per 1,000 gallons for each thousand gallons between 6,000 and 20,000 gallons and \$3.00 for each thousand gallons over 20,000 gallons.

Wastewater Operators Certified



These wastewater operators passed certification exams for treatment and collection grades 1, 2, 3 and 4. Congratulations to all !

Treatment grades 1, 2, 3 and 4

Grade 1: Keith Alosi, Tom Barnes, Michael Christopher, Sam Dennett, Tim Enterline, Nathan Johnson, Chris Kuhlemeier, Leslie Lorber, Arthur Porreca, Alan Smith, Thomas Taflin, Alycia Wood

Grade 2: Nathan Adams, Keith Brinkoetter, Elizabeth Clemens, Doug Gibson, Mark Simpson, Robert Zoncki

Grade 3: Darrell Gogert, Ron Jenkins

Grade 4: Richard Breese

Collection grades 1, 2, 3 and 4

Grade 1: Matthew Bell, Brad Bloesser, Merle Brandon, Steven Brown, Jerry Chester, Gerald Fitzgerald, Justin Mercado, Donald Porter, Ryan Robinson, Robert Watkins, William Wester

Grade 2: Ace Ariaz, Dave Darrenogue, Arnold Garcia, Chris Hansen, Timothy Hendricks, Timothy Lovett, Tom Metcalf, Ruben Moya, Jerald Preston, Antone Sallaberry, Kevin Schmith, Mark Speicher, Andrew Stanford, Erich Strunge, Patrick Walsh

Grade 3: Thomas McKinzey

Grade 4: Lawrence Cordano, Kent Vian

The NWEA Certification Board is pleased to announce that computerized exams are now being offered! Pencil and paper exams will continued to be offered quarterly for the same fees.

New Water Operators Certified



These water operators passed water certification exams for distribution and treatment grades 1, 2, 3 and 4. Congratulations to all !

Distribution grades 1, 2, 3 and 4

D-1: Roger Borda, Scott Carpenter, Eleodoro Colocho, Richard Giltner, Adrian Johnson, Duane Johnson, John Kinnie, Nancy Lightfoot, Wesley McClain, William McMullin, Robert Ragar, Gregory Schmett, Jerry Thomas, Larry Tiffany, Daniel Tompkins, Kurt Winans

D-2: Gary Billingsley, Keith Brinkoetter, Christopher Carter, Jason Dukek, Ronald Fry, Larry Grant, Reymundo Gutierrez, Elise Hoover, James Imperial, David Joseph, Michael Page, Gregory Phillips, Steven Priscu, Kevin Retterath, Marc Rohus, David Roy, Joseph Seng III, Sean Sinclair, Brian Wight

D-3: Jamie Doschadis, Brett Goodnow, Steven Jerome, Dennis Longhofer, Joseph Lozano, Jeremy Lustig, Alan Smith

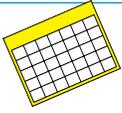
D-4: John Coffey Jr., John Hulett, Jorge Padinas, Jeffrey Renwick

Treatment grades 1, 2 and 3

T-1: Kevin Agrella, Michael Bailey, Darrel Blake, Daniel Chan, John Dufresne, Charlie Fong, Dennis Gaddy Sr., Adrian Johnson, John Kinnie, Adam Nabors, Jack Orr, Daniel Park, Jeffrey Todd, Herbert Weichmann

T-2: Ruben Arenas, Eduardo Cabo, Steven Henderson, Theodore Jost, Jeremy Lustig, Gregory Phillips, David Runion

T-3: Eric Sautter



Training Calendar for 2008

June 25/26 - Reno - Water Conservation. AWWA Workshop presented by Farr West Engineering. Call Carol Husband at 909/481-7200 x 2101 for more information.

July 9/10 in Yerington and July 23/24 in Hawthorne - Confined Space and Trench Safety Awareness. Contact NvRWA at 775/841-4222 or nvrwa.org for more information.💧

August 6/7 in Moapa and August 20/21 in Laughlin - Confined Space and Trench Safety Awareness. Contact NvRWA at 775/841-4222 or nvrwa.org for more information.💧

August 22 - Various locations - UNR Video conference. Topic: To Be Announced. Info: Crystel Montecinos at 775/240-1396.💧

September 10/11 - Eureka - Confined Space and Trench Safety Awareness. Contact NvRWA at 775/841-4222 or nvrwa.org for more information.💧

September 12 - Various locations - UNR Video conference. Topic: Review for Drinking Water Exam. Info: Crystel Montecinos at 775/240-1396.💧

September 24/25 - Ely - Confined Space and Trench Safety Awareness. Contact NvRWA at 775/841-4222 or nvrwa.org for more information.💧

October 24 - Various locations - UNR Video conference. Topic: To Be Announced. Info: Crystel Montecinos at 775/240-1396.💧

November 14 - Various locations - UNR Video conference. Topic: State & Federal Regulations. Info: Crystel Montecinos at 775/240-1396.💧

Ongoing - On-siter Training. Contact NvRWA at 775/841-4222 or nvrwa.org for more information.

December - Water Certification Exam Cancelled

Useful Training Contacts

University of Nevada, Reno Colleges of Agriculture, Biotechnology and Natural Resources & Cooperative Extension

UNR videoconference classes for water system operators and managers are available in most communities. To request a workshop in your area, call Crystel Montecinos at 775/240-1396 or e-mail: xtelle@aol.com.

Community College of Southern Nevada Wastewater & Water Technology Program

Info: LeAnna Risso, 702/434-6600 ext. 6418.

WWET Training in Clark County

Training for water treatment plant and distribution system operators, wastewater treatment plant and collection system operators, and other professionals working within these fields. Info: Jeff Butler 702/258-3296; see www.wwet.org for a current training calendar.

State of Nevada Water Certification Exams

All exams will be proctored on the date listed. Applications and fees are due to the state (Steve Brockway) 45 days before exam dates. A proctor will contact examinees to schedule testing. Contact Ron Penrose at 775/834-8017 for information about 2008 exam dates.

Water exams are scheduled quarterly at locations throughout the state. Info: 775/687-9527 or http://ndep.nv.gov/bsdw/cert_home.htm. Additional info: 775/465-2045 or www.nvwea.org. **NOTE: No Exam in Dec. '08**

Nevada Rural Water Association

Please send requests for training through nvrwa.org, or call 775/841-4222.

💧 This symbol designates Nevada Division of Environmental Protection pre-approved training for certification renewal contact hours.

Featured Operator: Scott Fleckenstein from Lyon County Utilities

(Continued from page 1)

LCU to make more efficient repairs to the distribution system. An added benefit will be increased emergency response capability.

Other future projects will include the update of the Emergency Response Plans for the Smith Valley Water System and the Dayton Valley Water System. Scott feels that regularly updating ERPs is an important way to protect the service population.

One goal Scott has for the water industry is

to improve accessibility to Operator Training, particularly for Grade 3 and Grade 4 Certification.

A unique approach adopted by Scott and other LCU employees, has been to organize a formal class based on the Ken Kerri review manuals.

Class frequency and duration were established in order to satisfy the NDEP requirements regarding Operator Training. He hopes to continue a similar training program into the future.

Nevada Drinking Water and Wastewater Training Coalition

**American Water Works Association
California/Nevada Section**
www.ca-nv-awwa.org
909/291-2101

Indian Health Service
Dominic Wolf, 775/784-5327
NDEP

<http://ndep.nv.gov>
Adele Basham, DWSRF, 775/687-9488
Michelle Stamates, AB 198 Water
Grant Program, 775/687-9331
My-Linh Nguyen, Wellhead Protection,
775/687-9422

Nevada Rural Water Association
www.nvrwa.org
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Public Utilities Commission of Nevada

www.puc.state.nv.us
Mark Clarkson, P.E., Water
Engineer, 775/684-6132
Leslie Tench, Senior Engineering
Analyst, 775/684-6140

Bureau of Safe Drinking Water
<http://ndep.nv.gov/bsdw/index.htm>
775/687-9520
Jim Balderson, SWAP, 687-9517
Steve Brockway, CEU approval, 687-9527
Patty Lechler, 687-9529
Bert Bellows, arsenic, 687-9525

Nevada Water Environment Association
www.nvwea.org
775/465-2045
Starlin Jones, 775/861-4104
Eric Leveque, 702/792-3711

Rural Community Assistance Corporation
www.rcac.org
775/323-8882
Stevan Palmer, 775/750-1844

**U.S. Environmental Protection
Agency, Region 9**
www.epa.gov/region09
Sara Jacobs, 415/972-3564

USDA Rural Development
www.usda.gov/rus/water/index.htm
Cheryl Couch, 775/887-1222, ext. 22
Kay Vernatter, 775/887-1222 ext. 28

**University of Nevada, Reno
Dept. of Civil Engineering**
Dean Adams, 775/784-1474

Tigren, Inc.
Crystal Montecinos, 775/240-1396

**UNR Colleges of Natural Resources
and Environmental Science, and
UNR Cooperative Extension**
www.unce.unr.edu/swp
Mark Walker, 775/784-1938
NDEP Board for Financing Water Projects
<http://ndep.nv.gov/bffwp/index.htm>
**Water/Wastewater Education and Training
Consortium of Southern Nevada — WWET**
www.wwet.org
Jeff Butler, 702/258-3296
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